63535 – 6.8 grams
63536 – 1 gram
63537 – 4.8 grams
Basaltic Impact Melt

Figure 1: Photo of 63535. Scale in mm. S72-55391

Figure 2: Photos of both sides of 63537. Sample is about 2 cm long. S80-37420 and S80-37417

Introduction

Rake sample 63520 was collected beside Shadow Rock (but not in the shadow) at Station 13 near North Ray Crater – see section on 63501. It included a number of small fragments of Impact Melt Rock – some with fine-grained basaltic texture (see Warner et al. 1973).

Petrography

Although the texture of 63535, 63536 and 63537 could be termed "basaltic", there are numerous small relic clasts that are incorporated in the matrix (figure 3). Thus it is an impact melt rock. Plagioclase laths are up to 100 microns long. Pyroxene compositions are given in figure 4.

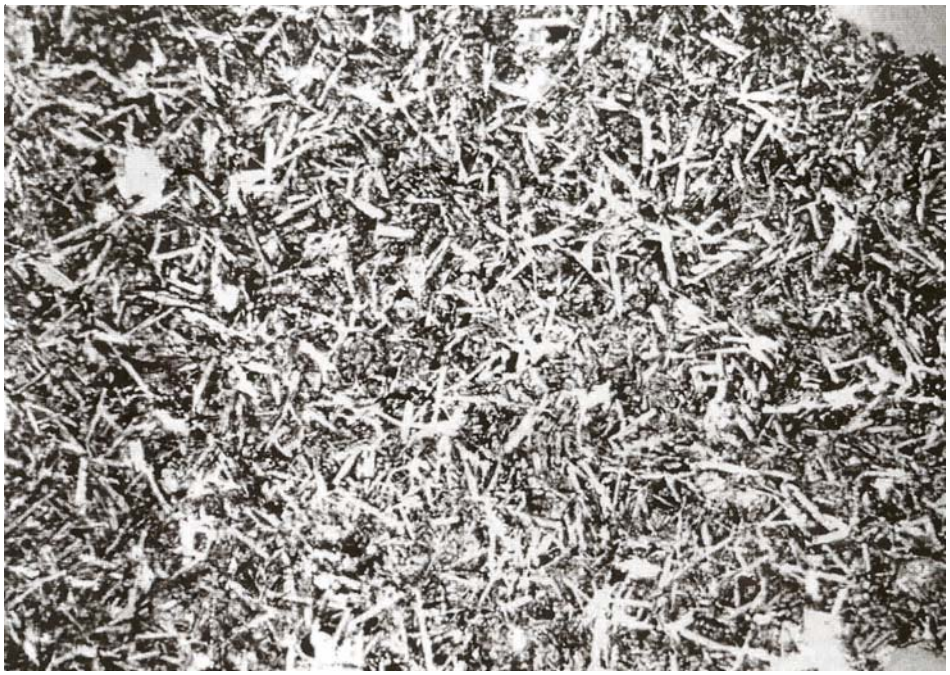


Figure 3: Thin section photomicrograph of 63537 showing fine-grained basaltic texture.

Gooley et al. (1973) found 3.8 % Ni in metallic iron grains and lots of schreibersite (confirmed by Hunter and Taylor 1981).

Thin sections of these walnuts resemble that for 63545 (reported separately).

Chemistry

Stoffler et al. (1985) reported an analysis. Also look at the paper by Korotev (1994).

Radiogenic age dating

Norman et al. (2006) published an Ar/Ar plateau diagram for 63537 (figure 6).

Other Studies

Pearce and Simonds (1974) determined the magnetic properties.

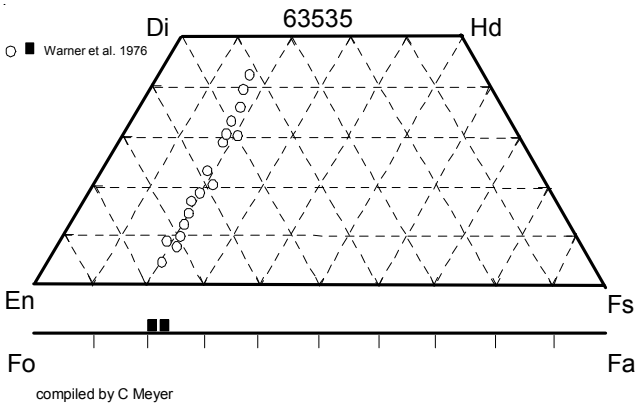


Figure 4: Composition of olivine and pyroxene in 63535 (Warner et al. 1973).

Table 1. Chemical composition of 63535

reference	Stoffler85	
weight		
SiO2 %	44.4	(a)
TiO2	0.67	(a)
Al2O3	22.4	(a)
FeO	6.3	(a)
MnO	0.06	(a)
MgO	12.2	(a)
CaO	13	(a)
Na2O	0.45	(a)
K2O	0.22	(a)
P2O5	0.15	(a)
S %		
sum		

(a) broad beam e. probe

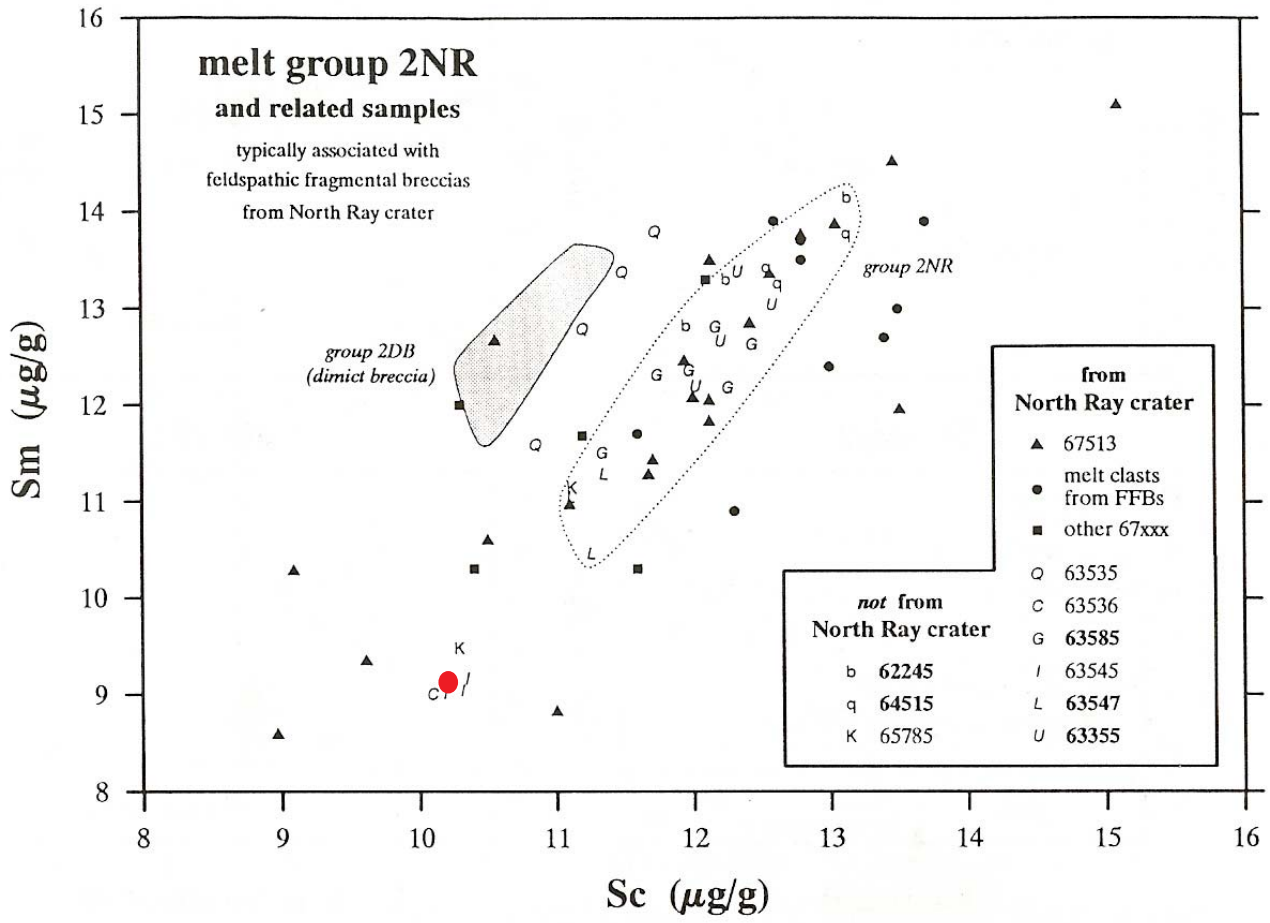


Figure 5: Randy Korotev must have unpublished data for A16 impact melts or he wouldn't be able to make this diagram.

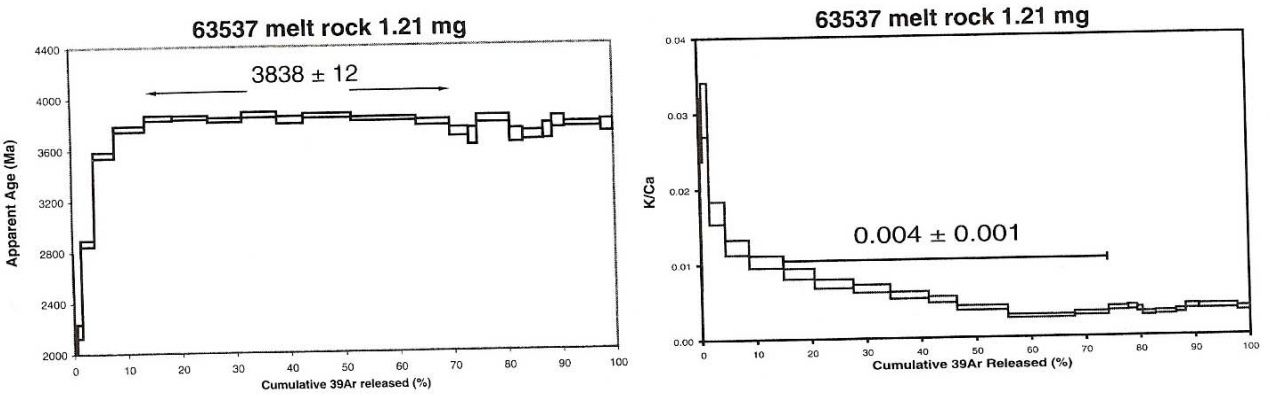
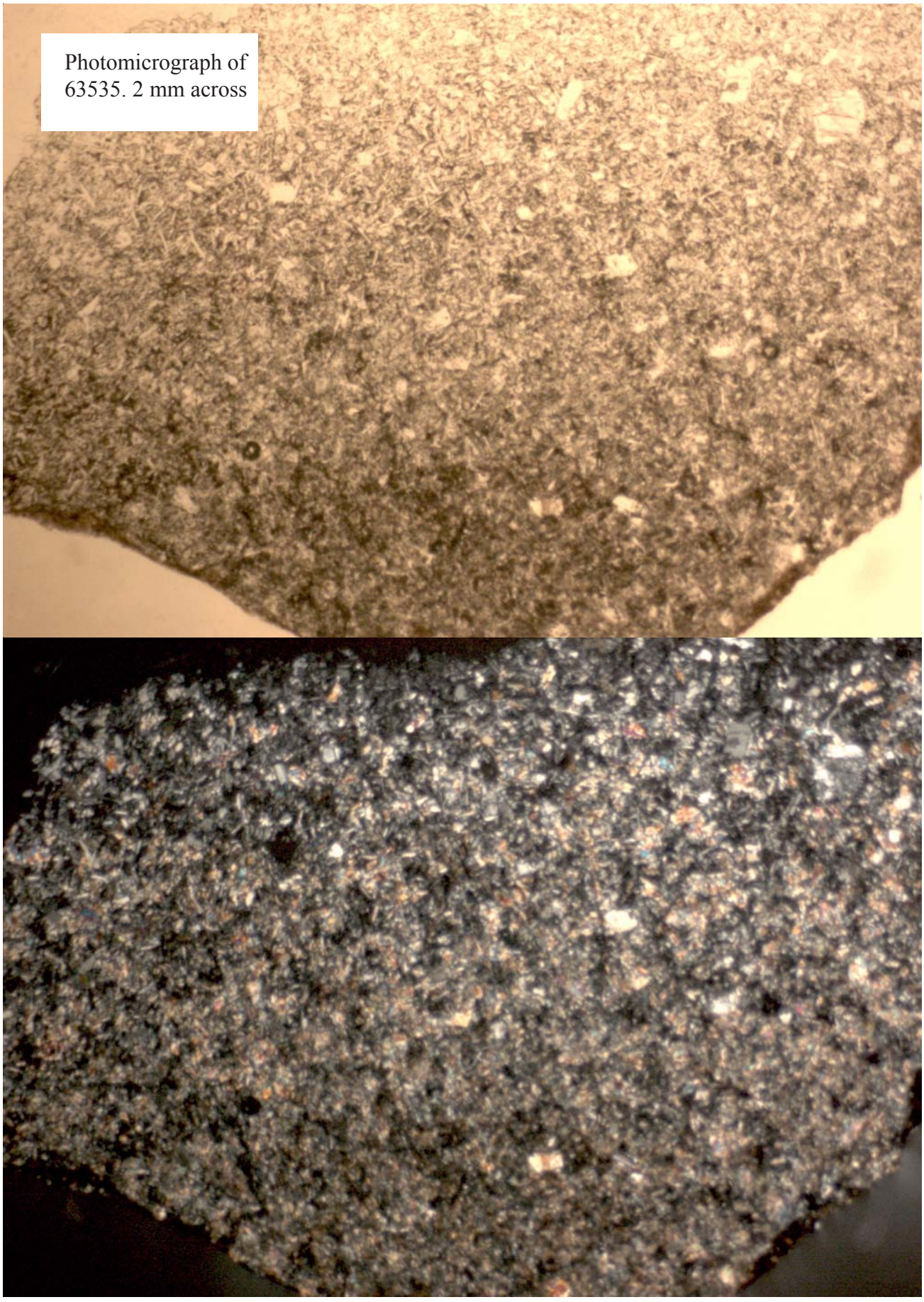
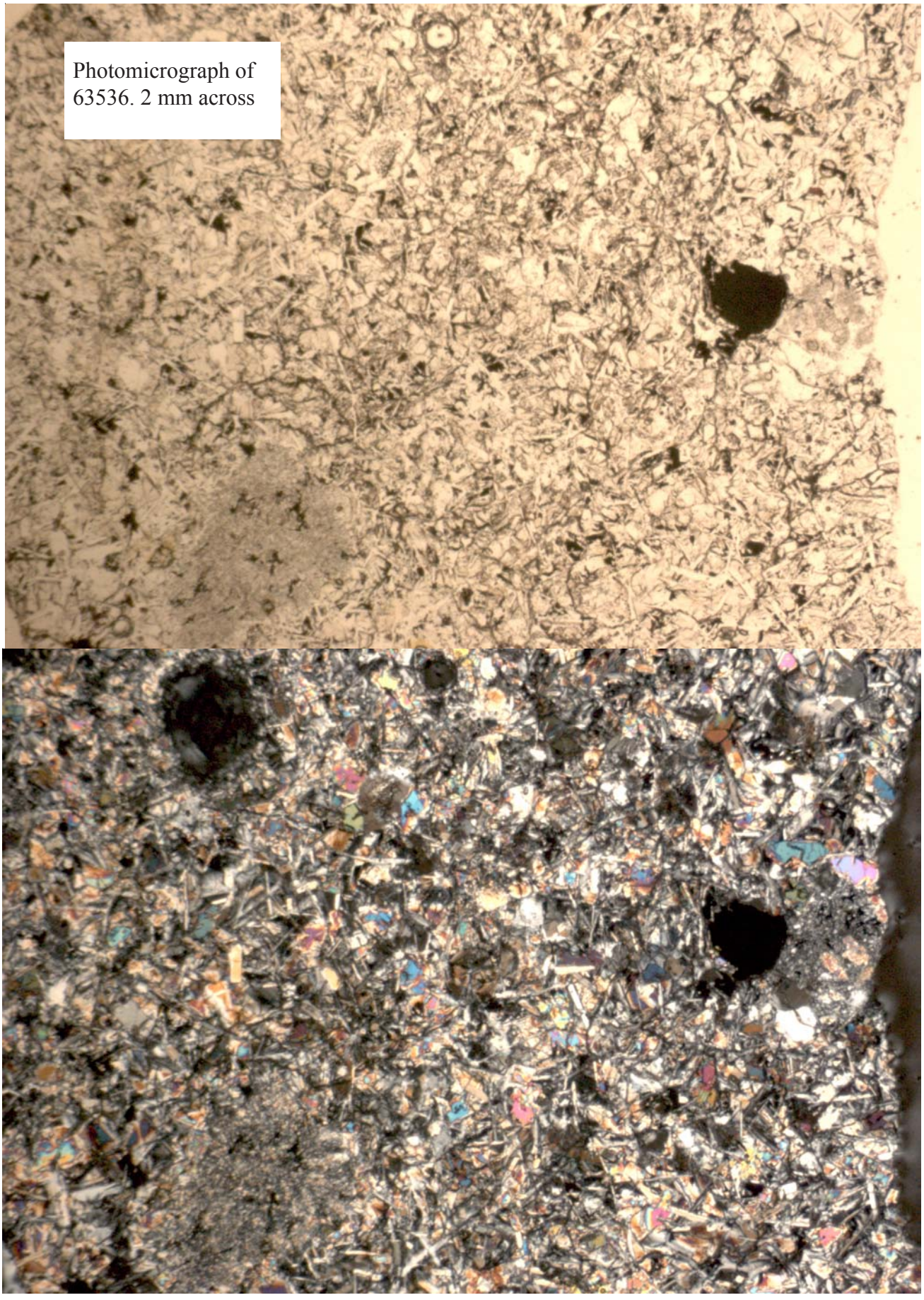
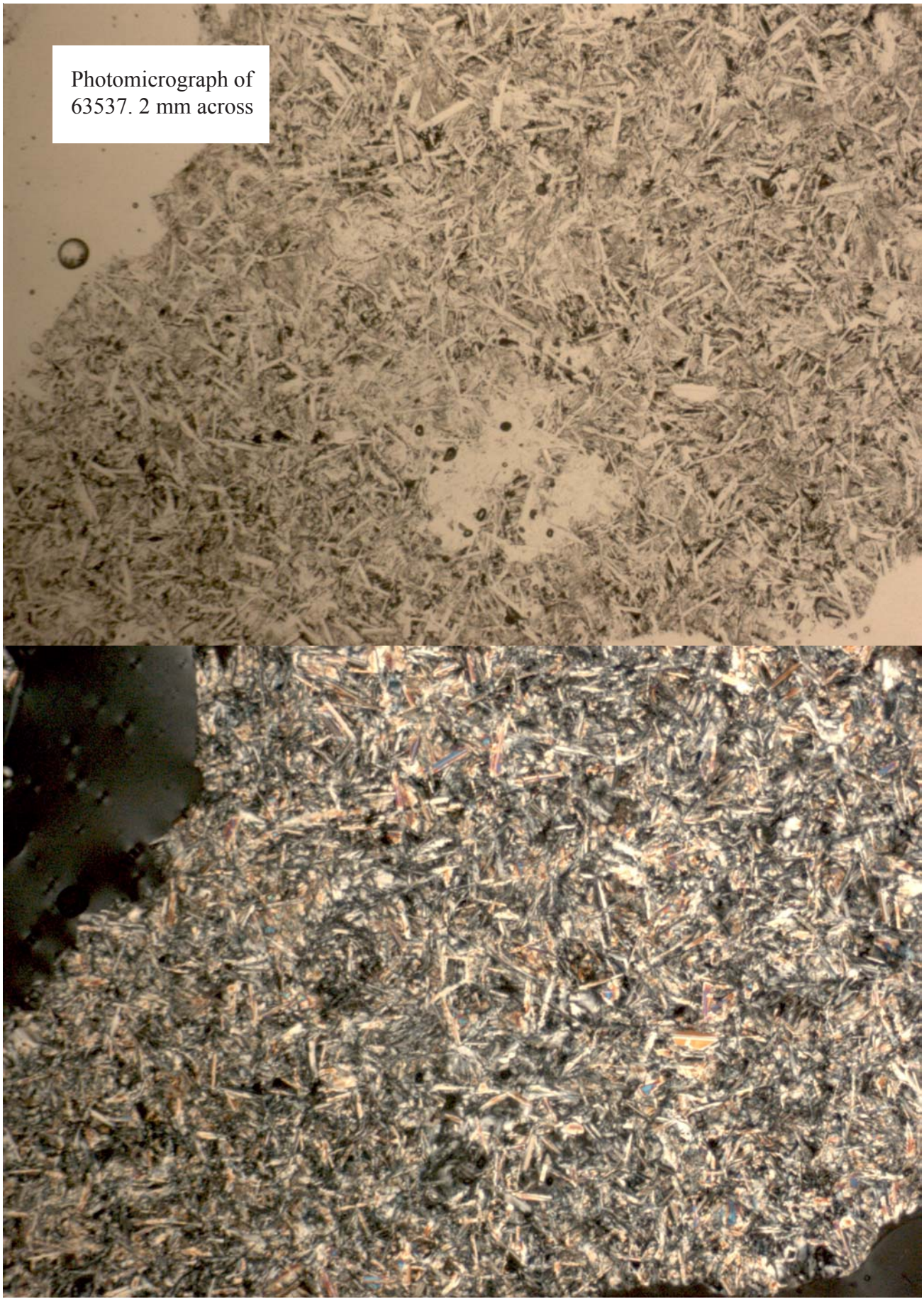


Figure 6: Ar/Ar plateau diagram for 63537 (Norman et al. 2006).


Photomicrograph of
63535. 2 mm across


Photomicrograph of
63536. 2 mm across


Photomicrograph of
63537. 2 mm across

References for 63535 and 63537

Butler P. (1972a) Lunar Sample Information Catalog Apollo 16. Lunar Receiving Laboratory. MSC 03210 Curator's Catalog. pp. 370.

Gooley R.C., Brett R. and Warner J.L. (1973) Crystallization history of metal particles in Apollo 16 rake samples. *Proc. 4th Lunar Sci. Conf.* 799-810.

Hunter R.H. and Taylor L.A. (1981) Rust and schreibersite in Apollo 16 highland rocks: Manifestations of volatile-element mobility. *Proc. 12th Lunar Planet. Sci. Conf.* 253-259.

Korotev R.L. (1994) Compositional variation in Apollo 16 impact melt breccias and inferences for the geology and bombardment history of the central highlands of the Moon. *Geochim. Cosmochim. Acta* **58**, 3931-3969.

LSPET (1973b) The Apollo 16 lunar samples: Petrographic and chemical description. *Science* **179**, 23-34.

LSPET (1972c) Preliminary examination of lunar samples. *In* Apollo 16 Preliminary Science Report. NASA SP-315, 7-1—7-58.

Norman M.D., Duncan R.A. and Huard J.J. (2006) Identifing impact events within the lunar cataclysm from ^{40}Ar-^{39}Ar ages and compositions of Apollo 16 impact melt rocks. *Geochim. Cosmochim. Acta* **70**, 6032-6049.

Pearce G.W. and Simonds C.H. (1974) Magnetic properties of Apollo 16 samples and implications for their mode of formation. *J. Geophys. Res*. **79**, 2953-2959.

Phinney W. and Lofgren G. (1973) Description, classification and inventory of Apollo 16 rake samples from stations 1, 4 and 13. Curators Office.

Ryder G. and Norman M.D. (1980) Catalog of Apollo 16 rocks (3 vol.). Curator's Office pub. #52, JSC #16904

Stöffler D., Ostertag R., Reimold W.U., Borchardt R., Malley J. and Rehfeldt A. (1981) Distribution and provenance of lunar highland rock types at North Ray Crater, Apollo 16. *Proc. 12th Lunar Planet. Sci. Conf.* 185-207.

Stöffler D., Bischoff A., Borchardt R., Burghele A., Deutsch A., Jessberger E.K., Ostertag R., Palme H., Spettel B., Reimold W.U., Wacker K. and Wanke H. (1985) Composition and evolution of the lunar crust in the Descartes highlands. *Proc. 15th Lunar Planet. Sci. Conf.* in J. Geophys. Res. **90**, C449-C506.

Sutton R.L. (1981) Documentation of Apollo 16 samples. *In* Geology of the Apollo 16 area, central lunar highlands. (Ulrich et al.) U.S.G.S. Prof. Paper 1048.

Warner J.L., Simonds C.H. and Phinney W.C. (1973b) Apollo 16 rocks: Classification and petrogenetic model. *Proc. 4th Lunar Sci. Conf.* 481-504.